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15 December 1981

East Europe Report

ECONOMIC AND INDUSTRIAL AFFAIRS

(FOUO 10/81)

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CZECHOSLOVAKIA

ROLE OF CHEMICALS, ADDITIVES IN LIVESTOCK PRODUCTION

Bratislava AGROCHEMIA in Czech No 10, Oct 81 pp 281-284

[Article by Eng Jaromir Nevole, Czech Planning Commission, Prague: "Use of Chemicals in Agriculture in Connection With Livestock Production in the Sixth and Seventh Five-Year Plans"]

[Text] An evaluation of the development of agriculture during the Sixth Five-Year Plan indicates that in spite of some positive aspects, such as further deepening of the process of concentration and specialization, particularly in livestock production, and a reinforcement of the production base with new equipment and the construction of new facilities, objectives regarding the quantity of agricultural output were not fully achieved, particularly as a result of several climatically unfavorable years.

The Sixth Five-Year Plan target for gross agricultural output was 95.2 percent fulfilled, that for gross crop output was 91.3 percent fulfilled, and that for gross livestock production was 98.5 percent fulfilled. Nor was the budgeted quantity of agricultural commodities for state stocks fully realized: there was a shortfall of 1.6 percent. Nonetheless, gross agricultural output showed a 9 percent increase compared with the Fifth Five-Year Plan, with gross crop production achieving a 6.7 percent increase and gross livestock production an 11 percent increase. Over the long term, livestock production is proving to be an intensifying factor in agricultural production as a whole. This is shown by the continual growth of its share of gross agricultural output, which was 52.5 percent for the Fourth Five-Year Plan and 54.8 percent for the Fifth Five-Year Plan and increased further to 55.7 percent in the Sixth Five-Year Plan.

This trend results exclusively from an increase in the output of slaughter hogs and poultry. While in value terms, cattle production in maintaining essentially the same share of gross agricultural output, the share of hog-raising products increased from 12.5 percent in 1966-1970 to 14.3 percent during the Sixth Five-Year Plan, and the share of poultry products increased from 8.8 percent to 11 percent. It is characteristic that in the same period, the total output of forage crops and root feed crops, i.e., the main cattle feeds, dropped in value terms from 9.8 percent to 7.3 percent of gross agricultural output.

Long-term analysis indicates that a change in the structure of crop and livestock production has not yet become desirable. The branches of livestock production which have the greatest requirements for concentrates are growing

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steadily, and substantially faster than cattle production. This is also indicated by a more detailed evaluation of the Sixth Five-Year Plan.

Compared with 1975, by 1980 the density of cattle per 100 hectares had increased 11.1 percent to 73.2 head, including 27.8 cows. In the same period the density of pigs per 100 hectares increased 19.6 percent to 163.2, and the figure for poultry increased 19.2 percent, with 977.4 fowl being raised per 100 hectares of arable land. Considerable success has been achieved in expanding yields. Nationwide milk yields passed the figure of 3,000 liters for the first time in the history of Czechoslovakia, reaching the figure of 3,084 liters, 10 percent higher than in 1975. Calf production per 100 cows increased 6.3 percent to 98.5. In addition, a number of agricultural enterprises and entire okreses have already considerably surpassed the level of 100 calves per 100 cows. In pig production, the figure of 16.7 pigs per sow has been reached, representing an increase of 5.2 percent in the period under consideration. Egg yields reached 228.3, an increase of 4.6.

The average annual output of slaughter cattle in the Sixth Five-Year Plan was 6.2 percent higher than in the Fifth Five-Year Plan, and milk output was 6.5 percent higher, while overall production of forage crops, calculated as hay, increased only 5.7 percent. The production of perennial forage crops on arable land even showed a drop of 7.7 percent.

The highly one-sided orientation of the production of bulk feeds toward annual forage crops in Czechoslovakia compared with selected West European countries is shown by the following comparison, which gives the shares of annual and perennial feed crops in total farm feedstuffs, calculated in starch units (as percentages, for 1977-1978):

	Proportion of all feedstuffs represented by farm feeds (Percentage of starch units)	Farm feed crops	
		Annual	Perennial
West Germany	52.5	25.2	69.7
France	66.5	21.8	77.77
Holland	37.5	12.0	86.4
Belgium	43.1	24.6	65.9
England	62.1	4.3	94.2
Denmark	37.1	21.6	63.3
CSSR	48.9	41.1	51.1

Also of interst is a comparison of the percentage of total cultivated land represented by areas planted to feed crops, i.e., meadows, pastureland, forage crops on arable lands, and root feed crops. In West Germany this figure is 48.1 percent, in France 57.8 percent, in Holland 65.4 percent, in Belgium 58.8 percent, in England 74.4 percent, in Denmark 29.5 percent, and in Czechoslovakia 45.1 percent.

In addition to problems of a quantitative nature in the production of bulk feeds, problems of a qualitative character also persist. A high percentage of annual forage crops is stored in the form of silage, but the chemical industry has not

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yet managed to produce the required preservatives. Foreign preparations, primarily based on propionic acid, are all but inaccessible for reasons of foreign exchange, and domestic preparations, primarily based on formic acid, are produced in quantities which fall far short of meeting the requirements. Unquestionably there is considerable potential for improving the quality of silage in the area of silage technology itself. The negative effect of bad silage on the health of animals is a well-known problem. Bad silage leads to a number of metabolic disorders in milk cows, and consequently in calves, which decrease their live weight at birth, increase their mortality rate and permanently lower their quality for further use. Thus mistakes are made not only in the procedures of breeding and raising the calves, but especially in the nutrition of the cows, so that disorders of the liver parenchyma are found at slaughter. Findings on the health of animals and its disruption made at slaughter should be utilized in agricultural enterprises to improve feed procedures.

An increase in the output of fodder crops must be achieved by means of a whole complex of measures. The frequently-used approach of applying high doses of nitrogen fertilizers produces a considerable increase in nonprotein nitrogen compared with protein nitrogen in bulk feeds. Problems arise either in preservation or in feeding. Elimination of 1 gram of excess nonprotein nitrogen in feed requires a milk cow to expend 20 to 30 kilojoules of energy, i.e., 2 to 3 grams of starch, which thus cannot be used for milk production. Constant use of chemical fertilizers also has certain negative effects on the mineral nutrition of cattle as a result of changes in the mineral content of the soil and leads to a number of undesirable consequences.

Problems of the quantity and quality of bulk feeds for cattle raising result in an excessively high consumption of concentrates. For example, concentrates consumption balance figures for the Sixth Five-Year Plan assumed that an average of 31 percent would be used for feeding cattle, while the actual figure was 38 percent. The consumption of concentrates per unit increase in live weight of cattle exceeds the balance standard by 15 to 31 percent, while the consumption for milk production exceeds the standard by 3 to 13 percent. There are constant shortcomings in the organization and technical standards of feeding, resulting in decreases of 10 to 15 percent from optimal yields. For example, correct organization of the feeding of milk cows with the same varieties of feeds (of good quality and not harmful to health, of course) could yield an additional 1.5 to 2 liters of milk per cow per day.

In sum, we may state that new views on the structure of cattle nourishment indicate that there is an energy deficiency in feeds when the percentage of nonprotein nitrogen is increased and when the acidity of feeds is high with inadequate mineral nutrients, which has an entirely negative impact on the effect of feed rations and the health of animals, and also, in a number of cases, on the quality of cattle products for further processing and human nutrition. The high acidity of feeds has a direct connection with an imbalance among the various components in milk, particularly minerals, which has unfavorable consequences for further processing of the milk and for the quality of food products.

The average annual output of slaughter pigs was up 17.9 percent in the Sixth Five-Year Plan compared with the Fifth Five-Year Plan, the output of slaughter

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poultry was up 28.7 percent and that of eggs 9.8 percent, while the average total annual domestic output of grains was up 8.1 percent. Even though we are including the results of years with poor harvests, still a number of other factors also made themselves felt. Drops in our own output had to be made up by special imports. This meant that allocations of grain to the central feed supply for the Sixth Five-Year Plan as a whole were almost 3-1/2 times the planned value. The total quantity of grain resources from our own production and import thus exceeded the level achieved in the Fifth Five-Year Plan by 16 percent. Total quantities of forage cake and livestock meals increased 17 percent compared with the Fifth Five-Year Plan. At the same time, the output of feed mixtures for the five-year plan as a whole was up 33 percent compared with the previous five-year plan. Basically, we may now say that the production of feed mixtures in Czechoslovakia is fully meeting the requirements of the socialist sector for hog and poultry raising, while in cattle raising it is doing a great deal to make up the shortcomings of our own feed base, and so is acting as an intensifying factor. Even though in 1980 the economic conditions for production of slaughter hogs, poultry and eggs worsened somewhat, to the advantage of cattle raising, the profitability is still so high and cattle-raising conditions are such that they make it possible to increase output further. The base is provided by the collective agricultural enterprises which have been built, in which the process of industrializing the sector includes elements of automation. However the risks involved in the production of cattle in large numbers in limited space, when the animals are bred for high productivity and a high level of feed utilization, are such that these cattle are practically incapable of existing without the comprehensive use of chemicals and biologicals, i.e., the use of a complete system of feed additives. In a situation where the percentage of forage cake and livestock meal as primary protein components fell from 14.1 percent in the Fifth Five-Year Plan to an average of 12.2 percent in the Sixth Five-Year Plan, it was only the extent of use of chemicals that enabled the livestock production results described above to be achieved. However, it is a fact that as prices have continued to rise on world markets, a shortage of foreign-exchange credits for the purchase of feed additives has made it impossible to use the optimal amounts of additives in feed mixtures. For example, the prices of most feed additives have increased approximately twofold in the past 5 years.

The increase in prices of selected feeds is shown by the following data (in percentages of the 1970 figures):

	1975	1980
Corn	198	233
Soy cake	150	290
Fish meal	124	256

The increasing dependency of livestock production on imports of critical components of feed mixtures is highly risky in terms of trade policy, because it makes meat production dependent on foreign deliveries.

There are also problems in domestic production, particularly in the provision of certain minerals and especially phosphorus.

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For the Sixth Five-Year Plan as a whole, while there was a considerable increase in the output of feed mixtures, it was not possible to assure that they had the required biological quality in terms of quantities of vitamins, main amino acids, minerals, effective protective substances and chemical and biological growth stimulators, even though it has been shown that introduction of chemicals into animal nutrition does the following:

--improves the biological quality of their nutrition, thus increasing the animals' resistance to stall diseases, infection and stress in handling;

--decreases losses from poor care forced slaughter and lowered vitality;

--affects the degree of feed utilization (in case of a considerable deficiency of the main vitamins, amino acids and minerals, fodder use increases up to 25 percent);

--increases the biological value of the final animal product, thus favorably affecting the quality of foodstuffs and the health of consumers.

A long-term evaluation of agricultural production trends indicates that while before the socialist reconstruction of the countryside production was carried on with a considerably lower degree of dependence on the other branches of the national economy, today, with the use of scientific and technical knowledge, the percentage of the means of production supplied to agriculture by other sectors of the national economy is increasing considerably. In foodstuff production, close connections are growing up between agriculture, the foodstuff and feeds industries, and the chemical, machine-building, fuels and energy and pharmaceuticals sectors. It is estimated that the chemical industry accounts for almost 15 percent of the final value of agricultural and foodstuff products, the feeds industry for 3 percent, agriculture itself for only 45.5 percent, the foods industry for 16 percent and so on. The consequence of this situation is that the responsibility of a much wider range of production sectors for foodstuff production is increasing. We must work systematically to assure proportionality among all sectors and branches and proper intersectorial relations. This is also true of sectors whose inputs into the agricultural-foods complex are quantitatively small but qualitatively irreplaceable.

In this connection, at the end of last year a basic set of documents entitled "A Program for the Use of Biochemicals and Chemicals in Agricultural Production During the Seventh Five-Year Plan" was compiled and approved by the CSSR Government Presidium. It stresses the high requirements which modern large-scale socialist livestock production has for biochemical and chemical preparations, which are indispensable both nutritionally and from the veterinary point of view. A deficiency of these specific substances, particularly health-protection substances, vitamins, minerals, amino acids, growth stimulators and the like, will result in great losses from poor care or necessary slaughter of both cattle and pigs, compared with the optimal possibilities. The incomplete biological value of feed mixtures also leads to a lower level of utilization of the feeds and to a decrease in the average daily weight gain, with a prolongation of the feed cycle. The program for use of biochemicals and chemicals in livestock

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production during the Seventh Five-Year Plan does not aim at solving the entire problem, but at finding ways to supply the most important preparations from domestic production by the end of the Seventh Five-Year Plan and the beginning of the Eighth. This involves especially tylosin, a specific antibiotic for large-scale livestock raising, coccidiostat, growth stimulators, important vitamins, expanded production in lysine, domestic production of dicalcium phosphate, and a changeover in production of biological factors and medicated feed preparations to the production of superconcentrates, which ultimately are turned out in premixed form by the feed industry. One new material is Oestrophan, a domestically-produced preparation used to control the reproduction of cows and heifers which can also be used in hog and sheep raising. This is an extremely demanding program in which all relevant sectors should take an active part, including direct cooperation by the scientific research base.

According to the program for the use of chemicals and biochemicals in livestock production, the problem presented by the other chemical and biological substances delivered to agriculture, which all have a greater or lesser effect on livestock production, the health of animals, the quality of livestock products, and the entire environment is an increasingly important central concern. This especially involves chemical fertilizers, whose increased effectiveness requires not only further increases in the concentration of nutrients and an improvement of their physical properties, but also their use under scientific conditions and a considerable decrease in losses during storage and application.

The article "Self-Sufficiency in the Production of Foods for Efficient Nutrition" by Academician K. Kudrna (VESMIR, March 1981) stresses that a basic condition for the operation of the entire agricultural system is the return of high-quality organic fertilizers to the soil. The article refers to the future necessity of so-called "waste-free" technological systems in agriculture, which among other things would decrease the negative effect of the current agricultural system on the environment. One of the preconditions for redressing the balance between energy applied from fossil sources and energy obtained from solar radiation is that of assuring the effectiveness of mineral fertilizers. One requirement is that of returning organic matter to the soil, so as to increase the content of high-molecular-weight humus compounds, which are essential for the development of microbial communities, and thus are a prerequisite for passage of the ions liberated from mineral salts into the underground organs of plants.

Increased fodder output cannot be achieved solely by increasing applications of mineral fertilizers, but also requires full and effective utilization of organic material from livestock production.

With regard to the hitherto frequency negative effect which the application of chemical pesticides has on the wholesomeness of feeds, and, via residues, on the quality of livestock products as well, Academician Kudrna also states that one important contribution which science makes to self-sufficiency will be findings which help us to change from a strategy of chemical protection of field crops to biological protection and to the possibility of decreasing the quantities of harmful substances. Integrated protection of field crops offers considerable possibilities for limiting the negative effects of chemical residues on the environment and human life. As a specific application, we may mention the conclusions of Docent Dr K. Blahy in his article "Use of Chemicals in Biology

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and of Biologicals in Chemistry" (VESMIR, March 1981), which states that juvenoids and pheromones, substances which are capable of influencing the development and communication of insects, deserve attention as promising substances which may be used as modern means of struggle against insects as part of integrated crop protection. This could be one of the greatest contributions of organic chemistry both to assuring the nourishment of the populace and to protecting the environment. At the same time, it might restore the none-too-good reputation of organic chemistry as the producer of the classical insecticides, which were only temporarily successful.

In dealing with the development of the agricultural-foodstuffs complex, the document "Main Directions of the Economic and Social Development of Czechoslovakia During 1981-1985," approved by the 16th CPCZ congress, accords top priority to expanding livestock production in keeping with actual feed supplies. The increase in output is to be achieved primarily by expanding cattle production, with an increase in the productivity of the animals. The expansion of types of production which have high requirements for concentrates is to be accommodated only to supply capabilities. By using knowledge about scientifically managed livestock nourishment, a higher degree of utilization of our fodder production than the current 10 to 15 percent is to be attained. The protein program which was adopted is to be carried out, and the program of use of biochemicals in livestock production is to be implemented gradually.

The basic goal is to maintain the previous meat consumption level of about 85 kilograms per capita and to meet the requirements of increasing population by increased output. The main task is to achieve structural changes. In accordance with the principles contained in the Main Directions, the draft Seventh Five-Year Plan expects a constant level or only a slight increase in the output of slaughter hogs and poultry. In contrast, it plans on an increase of 10.3 percent in the production of slaughter cattle and an increase of 6.2 percent in milk production over the 1980 level.

These basic structural tendencies mean that it will be necessary to round out the use of chemicals in pig and poultry raising in order gradually to reach the optimal level. In accomplishing the task of considerably increasing the output of cattle, and particularly slaughter cattle, it will be necessary to direct primary attention to methods and forms of the use of chemicals in this sector. In pig and poultry raising, the administration of additives is carried out primarily through enrichment of feed mixtures, which are the only feed used in large-scale production. The work will be more complex in cattle raising, because it will be necessary in particular to solve the problems associated with the health of the animals, which will require extensive cooperation with the veterinary service.

The use of chemicals in cattle raising must be accomplished primarily by means of centers for controlled cattle feeding and by active measures directed at crop production. Close cooperation with the agrochemical enterprises will help in finding ways of working together to keep the application of agrochemicals from degrading the quality and wholesomeness of bulk feeds. Working together with the scientific research base, it will be necessary to find new forms of agricultural protection which limit residues. The agrochemical problems in crop production cannot be separated from their possible effects on livestock production.

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CZECHOSLOVAKIA

CHEMICAL FERTILIZER TRENDS IN CSSR SURVEYED

Bratislava AGROCHEMIA in Slovak No 10, Oct 81 pp 1-2

[Article: "Trends in Consumption of Chemical Fertilizers in Czechoslovakia"]

[Text] During the Sixth Five-Year Plan the consumption of chemical fertilizers in Czechoslovakia reached a level which moved us into the ranks of the countries making intensive use of nutrients from chemical fertilizers in crop production. A survey of the consumption, production and indicators is given in Tables 1-4 and Figure 1.

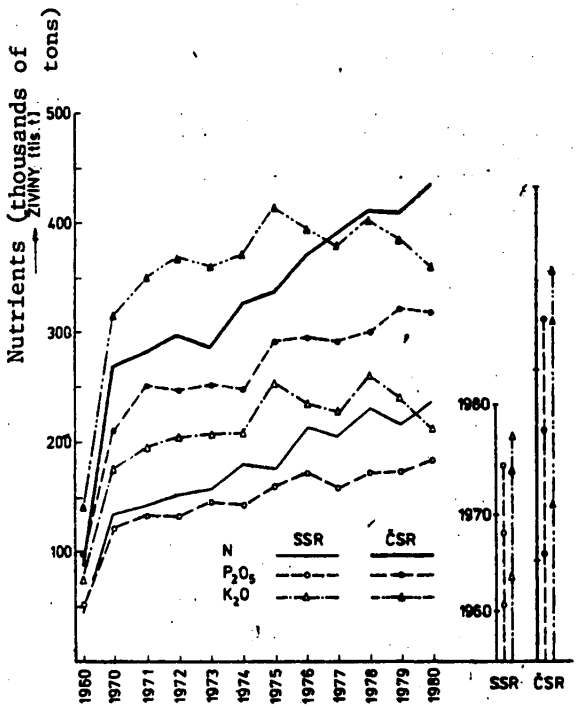

Figure 1.

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It is especially necessary to appreciate the qualitative change that has taken place in the quantities of chemical fertilizers used, particularly in the last 10 years. An increase in average concentration from 28 to 34 percent, an increase in the share of multicomponent fertilizers from 13 to 34 percent, and an increase in the share of granulated fertilizers from 37 to 62 percent in the period between 1970 and 1980 represent a truly fundamental change in the selection, which was fostered by innovations in domestic production rather than by effects produced on trade policy by the imported proportion of industrial fertilizers. The SSR continues to move in the directions described, for it increased the lead which it had already gained by 1970, making a jump from 28 to 42 percent in the concentration of fertilizers produced (the national average increased from 24 to 35 percent), from 33 to 54 percent in the percentage of multicomponent fertilizers (the national average increased from 23 to 44 percent) and from 53 to 79 percent in the percentage of granulated fertilizers (the national average increased from 50 to 70 percent). That this involved considerable new capacities in the SSR's chemical industry (enterprises of VHJ Slovchemia) is also attested by the increase in the SSR's share of nationwide output from 39.4 to 54 percent during that period, with the growth rate in the SSR reaching 235 percent compared with a national growth rate of 171 percent (and a rate of only 130 percent in the CSR).

The Sixth Five-Year Plan can be called the initial period of deliveries of liquid fertilizers, with the exception of ammonia for direct application, which already had a tradition of more than 10 years' standing by 1970; but its consumption has remained at the level of 3,000-4,000 tons of nitrogen a year, and shows a tendency to drop rather than to progress. The 2.2 percent share of nutrients accounted for by liquid fertilizers in 1980 is not a surprise, but for nitrogen fertilizers the figure is already 4.8 percent, and in terms of its prospects, a situation in which the chemical industry's production capacities are ahead of agriculture's ability to use them has developed. This disproportion is likely to increase until 1985.

The overall level of consumption of agricultural fertilizers in 1980 and their selection and quality indicators were critical in bringing about a change in the ratios of nutrients used, which occurred especially at the end of the Sixth Five-Year Plan, involving a drop in the percentage of potassium. The trend is clear from the table showing proportions of nutrients and from the graph of nutrient consumption. Nitrogen, the most extensively used fertilizer throughout the world, surpassed P_2O_5 in Czechoslovakia in 1968, but the consumption of K_2O still exceeded the consumption of nitrogen in 1979, although by only less than half a percentage point. In 1980, however, the consumption of K_2O is only 84 percent of the consumption of nitrogen for Czechoslovakia as a whole and 88 percent for Slovakia.

That this is a long-term, regular development is confirmed by the fact that there was a drop not only in the relative consumption of K_2O but also in the absolute quantities of potassium nutrients consumed, culminating in 1975 with a consumption of 669,000 tons of K_2O; the figure jumped again in 1978 to 663,000 tons of K_2O, but reached only 569,000 tons in 1980, the same level as in 1972-1974. The rate of increase of nitrogen consumption in the decade 1970-1980 was almost 170 percent, and the increase in consumption of P_2O_5 was 150 percent,

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but the increase in the consumption of K_2O was less than 116 percent. The SSR achieved a higher rate of growth than the national average (by 5 percent overall), particularly in nitrogen. In this connection, we may also note the absolute increase in consumption of nutrients in chemical fertilizers in the 1970-1980 period in comparison with the 1960-1970 period (see the right side of the consumption graph). The increases in use of nitrogen in the CSR and of P_2O_5 in both the CSR and SSR were almost as high in 1970-1980 as in 1960-1970 (the rates of growth in that decade were 220 and 280 percent), while the increase in use of nitrogen in the SSR was even higher (104,000 tons compared with 78,000 tons), and the increase in the use of K_2O dropped to a third (SSR) and a fourth (CSR) of the growth rate in 1960-1970.

Table 1. Consumption of Chemical Fertilizers in Czechoslovakia and Their Most Important Parameters

	CSSR					SSR		
	1950	1960	1970	1975	1980	1970	1975	1980
Thousand tons of nutrients ($N + P_2O_5 + K_2O$)	204	511	1226	1616	1741	428	579	628
Thousands of tons of products	843	2030	4360	4870	5099	1430	1602	1818
Average concentration	24	25	28	33	34	30	36	35
Share of multicomponent fertilizers (percentage of nutrients)	4	3	13	27	34	18	38	40
Share of liquid fertilizers (percentage of nutrients)	--	1	0.5	0.7	2.2	0.4	0.8	1.5
Share of granulated fertilizers (percentage of products)	11	27	37	54	62	39	56	68

Table 2. Production of Chemical Fertilizers in Czechoslovakia and Their Most Important Parameters

	CSSR			SSR		
	1970	1975	1980	1970	1975	1980
Thousands of tons of nutrients ($N = P_2O_5 + K_2O$)	708	1090	1214	279	517	656
Thousands of tons of products	2890	3820	3468	998	1505	1565
Average concentration	24	29	35	28	34	42
Share of multicomponent fertilizers (percentage of nutrients)	23	39	44	33	54	54
Share of liquid fertilizers (percentage of nutrients)	0.8	5	7	0.2	8	10
Share of granulated fertilizers (percentage of products)	50	61	70	53	61	79

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Table 3. Nutrient Ratios in Consumption of Chemical Fertilizers

		1921/22	1934/38	1950	1960	1970	1980
Consumption, in tons of pure nutrients							
N		7	22	56	124	404	675
P_2O_5		28	46	68	152	331	497
K_2O		9	26	83	217	491	569
Total		44	94	207	511	1226	1741
Ratio, N = 1							
CSSR	P_2O_5	3.94	2.09	1.20	1.07	0.82	0.74
	K_2O	1.30	1.18	1.47	1.53	1.22	0.84
SSR	P_2O_5		4.12	1.50	1.10	0.89	0.76
	K_2O		1.13	2.20	1.60	1.31	0.88

Table 4. Intensity of Consumption of Chemical Fertilizers by Kraj

		1 kg č. ž. NPK na 1 ha poľnohosp. pôdy				2 kg č. ž. NPK na 1 ha ornej pôdy a lúk		3 Pomer P_2O_5 k N		4 Pomer K_2O k N	
		1960	1970	1975	1980	1960	1980	1960	1980	1960	1980
5	Stredočeský	76	188	252	277	84	305	0,99	0,71	1,45	0,92
6	Juhočeský	69	154	211	243	75	264	1,13	0,77	1,46	0,74
7	Západočeský	65	173	231	249	74	283	1,02	0,70	1,29	0,67
8	Severočeský	78	167	229	237	92	280	1,03	0,76	1,41	0,67
9	Východočeský	78	180	238	265	86	293	1,11	0,72	1,66	0,88
10	Juhomoravský	77	203	252	259	86	1,02	0,68	1,51	0,88	
11	Severomoravský	73	167	233	234	87	278	1,08	0,79	1,63	0,89
12	Západoslovenský	89	217	287	312	101	352	1,00	0,80	1,71	0,98
13	Stredoslovenský	52	113	167	195	85	326	1,28	0,71	1,53	0,80
14	Východoslovenský	56	144	203	222	85	341	1,09	0,74	1,47	0,78
	ČSR	74	179	237	254	84	286	1,05	0,72	1,50	0,82
	SSR	67	163	224	249	92	342	1,09	0,76	1,60	0,88
	ČSSR	71	173	232	252	86	304	1,06	0,74	1,53	0,84

Key:
1. Kilograms of net nutrient (NPP) per hectare of agricultural land
2. Kilograms of pure nutrient (NPP) per hectare of arable land and meadowland
3. Ratio of P_2O_5 to N
4. Ratio of K_2O to N
5. Central Bohemian
6. South Bohemian
7. West Bohemian
8. North Bohemian
9. East Bohemian
10. South Moravian
11. North Moravian
12. West Slovak
13. Central Slovak
14. East Slovak

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In terms of the intensity of use of industrial fertilizers, the West Slovak Kraj continues to be the leader, with a level of approximately 125 percent of the national average. The lowest average nutrient applications per hectare of agricultural land are in the Central Slovak Kraj, where the figure ranges from 65 to 77 percent of the national average. When the consumption of chemical fertilizers is calculated per unit of arable land and meadowland, the West Slovak Kraj remains in first place, but the South Bohemian Kraj moves into last place, and the CSR as a whole has only 94 percent of the national average for this indicator. The lowest ration of P_2O_5 to nitrogen is in the South Moravian Kraj, while the greatest drop is shown by the Central Slovak Kraj, from 1.28 in 1960 to 0.71 in 1980. The smallest drop during this period is shown by the West Slovak Kraj, which along with the Central Bohemian Kraj had the lowest level in 1960, while in 1980 it was in first place with a ratio of 0.80, ahead of the North Moravian Kraj. The lowest ratio of K_2O to nitrogen was posted by the West Bohemian Krajs, while the greatest drop was posted by the North Bohemian Kraj, where the ratio of 0.67 in 1980 was only 47.5 percent of the 1960 figure. The greatest stability is shown by the Central Bohemian Kraj, where the ratio in 1980 exceeded 63 percent of the value in 1960, while the kraj moved from eighth place in 1960 to second place, behind only the West Slovak Kraj, in 1980. The latter kraj continues to have the highest ratio of K_2O to nitrogen.

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REPORT ON INTERVIEW WITH ECONOMISTS

PM240921 Turin LA STAMPA in Italian 22 Sep 81 p 3

[Report on interview with Jozsef Bogner by Frane Barbieri: "Hungary, Like an Eastern Bloc Switzerland"]

[Excerpt] The Polish crisis is, to some extent, everybody's crisis. Moscow is afraid that Poland might break loose from the Soviet zone, and the other socialist governments fear Polish contagion. All have economies in precarious states in dormant societies. A Polish-type explosion is to be expected from the combination of the two negative factors. The only country which does not feel a similar danger, at least in the short term, is Hungary. In Budapest they are not enthusiastic about Walesa but neither do they fear contagion.

Stability

We had the opportunity to discuss this phenomenon with two leading figures who have come from Budapest to take part in one of the edifying conventions on the Eastern Bloc economies organized by the socioeconomic problems studies and research center. In a sense they are two architects of the individual Hungarian model. The first is Rezso Nyers, former [MSZMP Central Committee] Politburo member who is regarded as "the father of the reform" and who was transferred to the post of head of the economics institute a few years ago (apparently because of excessively liberal ideas), but is still a Central Committee member and close to Kadar.

The second is Jozsef Bognar, chairman of the Academy of Sciences Economics Section [as published] who is also one of the party secretary's advisers.

We began the conversation by pointing out: "Both of the two Europes seem to have their own Switzerland. The only socialist country which boasts the absence of an economic crisis is Hungary. We know the reasons for Switzerland's stability. However, we find it more difficult to establish how Hungary has succeeded in becoming the East's Switzerland."

Professor Bognar was first to reply: "I would not say it was exactly a Switzerland. The Hungarian economy has serious problems too. We must restore the economic balance, above all the balance of payments. We are affected by the world crisis and are importing inflation. If there is an impression that

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our country has a stable economy, it is due to the maturity which the Hungarians have shown in assessing the situation. The most positive aspect to which the stability and containment of the crisis is due is the fact that we can implement our economic policy and introduce reforms in conditions of national calm."

Then came Nyers' turn: "In our country there is no crisis situation; we are living in sound political and economic conditions. However, I think the comparison with Switzerland is risky because we are facing more serious problems. But I think the main reason why we can boast a strong situation is as follows: the party has succeeded in drawing together the real dimensions of the situation and is not leaving economic development simply to economic forces--in other words it is able to take advantage of the means which planning can offer but, in addition, it does not have any fanatical belief in the whole series of tools of the planned economy but takes into consideration and stimulates individual and original initiatives. In Hungary we have succeeded in harmonizing the class policy with the nation's interests. However, we are now facing a problem: the vitality of socialist democracy is inadequate. Political planning of economic processes should be taken to a higher and more coordinated level. This must be done to avoid reaching a critical situation in the future without foreseeing it."

Emergency

We pointed out: "Caution, based on bitter experience, makes the Hungarians avoid comparisons. However, it is necessary to point out that in the building of the Hungarian model trade and finance, in other words the market, have been discovered as a component and lever in a socialist economy. In the other countries either these factors are not recognized or they are considered to be secondary compared with the inflexible myth surrounding production. If the market is accepted in those countries it is treated as something to be suffered and suppressed as soon as possible, since it is an element which is foreign to socialism. The Hungarians, however, talk of the market not as a capitalist or socialist factor but as a test of the ability to run the economy: somebody who is unable to run the market ends to suppress it. From this viewpoint, is the Hungarian model a mixed, crisis concept or an integral, definitive concept or a new socialist economy?

Nyers replied: "In designing our model we were helped by the crisis. It was the crisis which led us to discover the new possibilities and the need to design a model. The crisis was the tragic events of 1956. In the model we do not consider the market as a transitory thing to be transcended in future development but as a permanent factor. The market is an organic part of our model, just as planning is. They are part of a single concept. We think that, without the discovery of the way in which the market works, even planning could not be effective."

We objected: "We have often heard you invoke the so-called 'New Economic Policy' [NEP] formulated by Lenin. But in the USSR the NEP was a makeshift solution immediately absorbed by the existing system. The fact remains that no other socialist country has tried to implement it. Officially, in Moscow the NEP is still considered a weakening of socialism. Only in your country does it seem to adopt general aspects and a more than temporary value."

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Nyers said: "This Leninist theory of the NEP is indeed regarded as a backward step from the building of a socialist economy. Nevertheless, the NEP can also be considered a theory that provides the general outlines of an economic model. Those, like us, who believe in a reform accept it in this latter interpretation, namely the idea that the NEP is a general and permanent guideline."

Bognar said: "I am of the opinion that we must examine the real relationships in a society in its various new and real elements and not always invoke them classics. In our analysis of the real situation we have realized that the market, the relationship between goods and money, plays a very important role. Consequently, we are trying to extend it instead of reducing it. I mean the world market too. There were many people who supported the theory that the socialist countries would not suffer the effects of the crisis of capitalism. When we are obliged to purchase something at a higher price on the world market we, too, are in the position of suffering the effects of the world crisis. This means that these influences are also present in the Hungarian economy to a more or less accentuated extent, depending on how far we manage to control them. But I must say that, despite the negative trends, the world market has played an important role in the development of the socialist economy, and that it has made it progress."

We put forward another objection: "In the Hungarian reforms the economic aspect seems to have been stressed and the political and social aspects overlooked. How then is it possible to explain a certain absence of civil and social conflicts in the country--the kind of tolerant patience or almost national silence concerning official policy."

Nyers replied: "I would like to say at once that as far as the development of political relations is concerned--and here I mean the consensus, the relations of trust between the government leadership and the masses--this development preceded the economic reform, following the 1956 events. However, before 1968 participation in the management of enterprises was very limited. Then there was a major step forward. Now, however, it is also true that the demands for a further political development are becoming greater and greater, since economic development has overtaken political development. Though I must say that the economic reform has not been apolitical."

Culture

We pointed out that "all this does not explain the absence of any real dissidence and the absence of cultural conflict in Hungary. Following the 1956 trauma the Hungarian people, of all the Eastern Bloc countries, have created the fewest difficulties for their own government--and not as result of authoritarian pressure."

Bognar said: "The country's political leadership has agreed in its assessment that its position would be strengthened if it could create a successful economic system. The reform has facilitated the expression of various interests in the economic field. Various social groups and various economic sectors compete

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within the framework of the system and seek to express themselves as best they can. These are the intentions of the second period of reform, started in 1978. At the outset in 1968 the reform was prevalently economic: a broader reform embracing the political structures would have achieved lesser results since this requires a unitary stance and broad support from the population."

We objected that the reason for this is not very clear. Bognar replied: "It was because at that moment it was impossible to foresee only favorable repercussions on the international plane."

We interpret his reply as a reference to possible Soviet pressures (which were in fact felt at one stage) which would have impeded or hindered the course of the reform. We also observe that it is still impossible to see clearly the attitude of the cultural sphere toward a reform so exclusively based on the economy as to seem almost mechanical.

Bognar explained: "Culture is a different system of values. At the outset we were convinced that the writers were on our side. They wanted more freedom in literature and wanted more in the economy. We did not think that the economy did not come first in their scale of values. Following the reform we had polemics with several writers. The polemics are still not over: there is still extensive elucidation work to be done for the world of culture to be able to accept a program centered on the economy."

We asked: "In view of the new political and cultural demands that you are talking about, what are the plans of the new reform phase?

Conflicts

Bognar replied first: "Now we must tackle the issue of the restriction of the state's powers. Not in the sense that the state must renounce all its prerogatives, but in the sense that we have discovered that the state cannot be the source of prosperity. The state cannot do and guarantee everything. We must put society in a position to sustain its own conflicts. Centralized government is unsuitable for resolving these conflicts inasmuch as it eventually centralized them too. Hitherto unrest in the student canteens has been dealt with by the Central Committee. A way must be found of resolving the conflicts within the context in which they emerge. We must increase the tolerance of disputes."

Nyers added: "An economic policy that fails to take account of the cultural aspects cannot succeed. In a contemporary socialist society action carried out within society must be due not so much to the state but rather to individual groups. Often this activity must be assisted and stimulated by the state, and the politician must recognize that we human beings--and not the state--are the source of happiness."

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We tried to specify the nature of the Hungarian model: "There is the formula of bureaucratic socialism (the Soviet kind) and there is the formula of self-managed socialism (the Yugoslav kind): Can the Hungarian formula be described as entrepreneurial socialism?"

Nyers replied: "I do not agree. Ours is a socialism of the workers, of the enterpreneurs and of the political protagonists. Also of a patient people, with a tragic experience behind them."

Bognar added: "In our model the entrepreneur has an important role but he is not an entrepreneur on his own account. He must ensure the success of social economic activity to enable the worker to have more."

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